RESEARCH HIGHLIGHT

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How-to Information Gaps and Priorities for Developers and Builders for Sustainable Residential Developments

BACKGROUND

There is a growing interest among land developers, builders, municipalities and housing sector professionals for best practice information on how to plan and develop sustainable residential developments.

In 2009, CMHC published an inventory of 81 how-to resources available to those in the Canadian housing sector—developers and builders, municipalities and other housing professionals who wish to achieve a higher level of neighbourhood and community sustainability. Ten topics and 53 sub-topics are covered in the *Inventory and Assessment of Sustainable Community Best Practice Guides for the Canadian Housing Sector*. The research also identified gaps in how-to information.

Although not an exhaustive search for all available how-to resources, the inventory provides a "first pass" at identifying and documenting available resources and indicates the general quality, level of detail and type of resources available in most topic areas. The resources in this inventory provide useful how-to guidance on many topic areas relating to residential developments in sustainable communities. Most of the resources identified are of high quality and present a useful level of detail.

A copy of the inventory and accompanying report is available through the Canadian Housing Information Centre. A research highlight summarizing the research findings is available on CMHC's website at http://www.cmhc.ca/od/?pid=66640 (English) and http://www.schl.ca/bdc/?pid=66641 (French).

As the next step, CMHC interviewed development industry representatives from across the country to obtain their experience with accessing how-to information, the gaps they have found and the priorities they place on filling those gaps.

METHODOLOGY

CMHC interviewed 17 developers and builders[1]. The developers and builders were identified with the support and assistance[2] of the Canadian Home Builders' Association.

Those participating in the telephone interviews vary in their level of experience in sustainable residential development and, in particular, in the range of sustainable practices they have implemented. Several indicated greater experience with green practices for the building envelope than for the development of sustainable neighbourhoods. Some are large companies that work in several cities across the country. Others are smaller and develop and/or build in one community only. The larger developers generally have in-house expertise and "green teams" with capabilities to search out new approaches and investigate their applicability. Many rely on consultants to search innovative practices and determine whether they are relevant, economically viable, marketable and approvable by local authorities. Smaller developers and builders take on at least some of the investigations themselves without the benefit of in-house experts or external consultants.

The questions that were used to guide the discussions were developed in consultation with the CHBA. The participants provided information on the types of approaches they have

[1] One developer was unable to schedule a telephone interview and instead responded via e-mail to the questions that were used to guide the phone discussions.

[2] The developers and builders interviewed work in British Columbia, Alberta, Saskatchewan, Ontario, Newfoundland and Labrador, and Nova Scotia.

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or are currently implementing or that they have considered in the past or plan to investigate. In addition to sustainable practices at the lot and neighbourhood scale, many also noted practices relating to the building envelope. In addition to providing information on the gaps that they have encountered in their research on these practices, the developers/builders were provided with the gaps that have been identified in CMHC's inventory of how-to resources and asked to indicate whether they agreed with these gaps and to specify the priority they place on filling those gaps.

MAJOR FINDINGS

Information needs and priorities

The developers and builders identified their information needs, the gaps that they have encountered and the priorities they place on those gaps. An overall impression from the interviews is that most of the developers and builders are interested and motivated to learn more about sustainable practices and are committed to implementing those that are viable and for which a good business case can be made. However, some do less in the way of sustainable residential development because they feel that the cost would not yield an acceptable return. It is apparent that many in the building and development industry are unaware of some of the existing information and how-to resources currently available and accessible to them. Furthermore, many of the available resources do not fully address their needs.

Observations regarding their primary and other information needs are as follows:

- **Lack of consensus on information gaps and priorities.** There is no consensus among those interviewed regarding the gaps in how-to information and priorities for filling those gaps. With the exception of waste and materials management, for which no gaps were identified by any of the developers/builders, gaps were identified in each of the topic areas by at least some of the developers/builders. This is a reflection of the varied needs and experiences of those interviewed, the type of residential developments they create, and the regional and local contexts in which they work.
- **Gaps in information by topic area.** Of the topic areas, gaps in information on leading-edge practices in water, wastewater and stormwater management were identified most frequently, followed closely by approaches for greywater reuse, information on the Canadian jurisdictions where sustainable practices have been applied, regulatory and approval issues, costs and cost comparisons, and stakeholder engagement for developers and builders. Priorities for filling the gaps in how-to information mirror the how-to information needs.
- **Cost and financial information** for sustainable approaches, practices and technologies was identified frequently. The type of cost information that the developers and builders require includes:
  - Cost-benefit and payback information and information regarding whether performance is worth the additional cost, such as the cost-effectiveness of xeriscaping.
  - The cost of operations and maintenance and the way to recoup costs. Developers/builders are also interested in understanding cost from a municipality's perspective.
  - Information on new mechanisms for financing sustainable practices and technologies, and alternative funding sources. A condominium developer found that buyers were not willing to pay for the additional costs associated with more sustainable features in the development. The developer arranged for a green loan from a not-for-profit environmental agency, which is to be paid back by the condominium corporation over a number of years. Since one of the biggest hurdles to implementing sustainable practices involves the additional cost and the unwillingness of buyers to pay, information is required for developers regarding alternative means of paying for increased costs, without raising the cost to buyers.
  - Despite the need for cost information, several developers and builders are of the view that it would be difficult to provide. Two reasons are offered: 1) they are doubtful that members of the industry would share cost information; and 2) the value of any cost information, particularly information provided through a national level guide, is questioned. Generic cost information is not viewed as useful, as any number of different factors at play can influence cost. Costs can vary from region to region and can be affected by the context, site conditions and regulatory requirements. Some see this as posing difficulty in providing defensible and accurate cost information; others suggest that the factors that influence cost need to be addressed in any information provided.

- Those more experienced in implementing sustainable practices expressed caution on the presentation and use of cost information. If cost is the sole consideration, some practices might not be considered. They advised that a developer wishing to implement an approach needs to determine how to make it work from a cost perspective, such as looking for opportunities or synergies to reduce costs. It was pointed out that cost can be offset elsewhere in a development and contextual implications would be more relevant to provide.
- Ballpark information would be helpful, such as trials, cost-benefit information and cost relationship information (for example, spending 20 per cent more will save $X), as would information on whether those who had undertaken an approach or practice would do it again from a cost perspective.

- **Municipalities would benefit from how-to information.** The developers and builders frequently suggested that municipalities and municipal organizations such as transit authorities, fire departments and public utilities would benefit from information that would raise their comfort level regarding sustainable practices and build their awareness and understanding of the implications of what they are requiring developers/builders to do. The information municipalities are seen as needing includes:
  - Information on the operations and maintenance implications and alternative management models for sustainable practices. This information is seen as required for many of the topic areas, including stormwater management, landscaping, parks and urban gardens, road and parking standards, and new energy systems.
  - Information on partnership models and approaches for the ongoing operations of new alternative facilities, such as those for sewage treatment, and geothermal and district energy systems.
  - Developers and builders interviewed reported that they often face a disconnect between what a municipality says it would like to see in residential developments and what it will approve. In their experience, municipal departments are not all on board, with some, such as engineering, the parks department and the transit authority, relying on the tried and true. Municipal requirements and standards are often not appropriate for innovative approaches. Interviewees felt that municipalities would benefit from information on how to align their requirements with new approaches and practices and on what other municipalities have done in this regard.
  - The developers and builders see that municipalities would benefit from information on the performance and benefits of alternative approaches and standards, including the experience of other municipalities. They report that many municipalities do not accept evidence regarding the benefits of approaches such as technologies that reduce water use and are consequently unwilling to approve reductions in infrastructure size.
  - It was suggested that municipalities require cost information so that they can be aware of the cost premiums associated with the sustainable practices they are requiring of developers/builders and their impact on housing affordability. This would relate, for example, to the standards that many municipalities are beginning to use.
  - Municipalities require information that clearly identifies what works in different contexts. Developers point out that not every approach works in all instances, but that, in their experience, municipalities attempt to apply a "one size fits all" approach. Similarly, the interviewees reported that municipalities are beginning to use standards as prerequisites for planning, without understanding the implications or impacts on practicability.
  - Other information that the developers and builders suggest municipalities would benefit from include information on who has approved what innovative approaches and what was done to successfully overcome the issues at the municipal level; information on innovative practices; and information on performance-based design and its application.
- **Performance of sustainable practices.** The developers and builders require information on the performance of sustainable practices:
  - Information is required on benchmarking and monitoring results of the impacts and successes of approaches and practices, including long-term performance, the real

benefits and impacts, such as the difference that a particular sustainable practice makes. Examples given by the developers include information on the appropriateness, marketability and relevance of densification and mixed-use developments in small communities; information on how to xeriscape to achieve good aesthetics and how to design neighbourhoods to ensure flexibility, such as to accommodate unforeseen future changes; and, for technologies, information on whether a trade is available and trained to provide service in case of a breakdown.

- Third-party, objective information is needed on the potential risks and experiences associated with sustainable practices. Developers and builders interviewed reported that they currently must rely on manufacturer claims or on information from those who promote specific practices but provide little or no supporting evidence.
- Developers and builders face challenges in obtaining reliable and non-contradictory information. Information is required on why something works well in one location and not in another.
- Many sources promote sustainable practices but do not provide information on how to implement them. For example, small village-style retail is promoted as an important component of successful compact, mixed-use communities, but information on how to make that happen is not provided. Information needs include the number and type of units required to make it work, appropriate types of retail, and required population, approaches for attracting the right businesses and ways to put deals together to get the right businesses.
- Developers/builders are seeking Canadian information and sources. They currently rely frequently on international sources, which are not always applicable in the Canadian context. In the case of stormwater management, it was noted that, while credible information is available, much of it comes from the US. More Canadian research is required, such as for greywater and black water.
- Marketing information is required, including how to convey the benefits of an environmentally responsible development to the customer.

Among the topic areas, the developers and builders mentioned information needs for water and community energy systems.

- **Stormwater and wastewater**, including:
  - Information on greywater and alternative approaches, including regulatory information, places where greywater reuse has worked and been approved and ways in which approval issues were overcome, as well as specific information such as whether bathtub water can be reused in toilets.
  - Information on stormwater management alternatives, including constructed wetlands, treatment and habitat, and on what municipalities worldwide are doing regarding stormwater management.
- **Community energy and renewable energy systems**, including district energy, geothermal energy, wind, solar, biomass and sewer heat recovery systems:
  - District energy: the parameters that influence solutions in different contexts (for example, site and geographic location), the experiences of others, system cost and payback time, ways to reduce some of the costs, and operational experience, such as reliability and ease of understanding on the part of users. Staging information and its implications are required for district energy systems, including implications when more than one developer is involved. A specific information need noted concerns the right mechanism(s) to construct hydronic heating systems in order to accommodate connections for future district heating. It was pointed out that, if homes built today are not constructed to allow for connection for district heating, district heating will not be possible in the future.
  - Geothermal energy systems information requirements: the feasibility of geothermal systems for multi-family developments and the experience of others, ways to implement geothermal systems, the cost and payback time of such systems, operational experience, including reliability and ease of understanding by users, information on models for long-term operations and management of geothermal systems.
  - Wind energy: feasibility and site management information.

- Solar energy, including passive solar: information on solar orientation, including precedent examples, as well as solar readiness and its implications for site planning.
- Biomass and sewer heat recovery energy system: information on long- term management models and options, ways to maintain the system's integrity during the project development phase, and timing for bringing the system on.

- **Regulatory and approvals information.** Developers and builders are seeking regulatory and approval information, including:
  - Information on the jurisdictions in which approaches and practices have been approved, including those that have been approved or are acceptable in other provinces and by other municipalities.
  - Approval information, including information on the issues that were encountered, ways in which approval issues have been overcome by others and lessons learned, as well as the approval process with respect to sustainable practices.
  - Information on regulatory issues that have been encountered.
  - Information on the legal issues associated with sustainable practices.
  - Information about how to proactively engage stakeholders.

Format for how-to information

There is support for many of the formats identified to those interviewed. Formats for their consideration were manuals, handbooks, detailed case studies, pro-forma documents, tools, standards or guidelines, and templates. The developers/builders offered additional suggestions: Web-based databases, an electronic library, online blogs, interactive Web-based forums and Web seminars. A recurring theme is the desire for material to be frequently updated, easily accessible, interactive, searchable and centrally located. An effective means of notification when new information becomes available is seen as important also.

- Case studies were most frequently identified as the preferred format to provide how-to information. The type of information suggested to be part of case studies includes what has been done elsewhere and how, what results/ performance were obtained, including modelling information, what parameters led to the results, how to gauge performance, whether it was successful, how it could be applied in different contexts, what are the risks, how to deal with them and what are the safeguards, how to gain approval, what are the costs, including payback, and who are the contacts for follow-up.
- Another frequently identified format is electronic sources for case studies, best practice guides or manuals. Suggestions included electronic manuals that could be updated frequently, online guides with regular updates and notification to people when changes are made, a clearing house or database of best practices across all topic areas, a list of projects and the people having worked on them who could share their experience.
- It was suggested that the format would depend on the audience and the type of information. Development executives would benefit most from case studies that provided information on how a practice has worked elsewhere and the pro forma. Project managers would benefit from manuals that address what to do and why and how to do it. Field staff would require more specific how-to information such as the appropriate tools or equipment to use. Overall, at this point in time, it is the case studies and pro forma documents that would be a priority.

CONCLUSIONS

CMHC interviews with a sample of Canadian land developers and homebuilders reveal a range in experience and needs regarding information on sustainable community planning practices. There is a lack of consensus on information gaps and priorities, as gaps were identified in almost all topic areas. Most frequently mentioned were leading-edge practices in water, wastewater and stormwater management, greywater reuse, and regulatory and approval practices in Canadian jurisdictions. For all topic areas, the type of information sought included detailed costs and cost comparisons, best practice examples and case studies, and performance evaluations. Builders and developers frequently suggested that municipal development approval officials and municipal organizations such as transit authorities, fire departments and utilities could also benefit from best practices and how-to information in order to raise their comfort level regarding sustainable practices and the implications of their development requirements and standards.

When comparing the needs expressed in the interviews with the resources previously identified through CMHC's *Inventory and Assessment of Sustainable Community Best Practice Guides for the Canadian Housing Sector*, it is apparent that many in the building and development industry are unaware of some of the existing information and how-to resources currently available and accessible to them. Furthermore, many of the available resources do not fully address their needs. The information gathered through the inventory project and the follow-up interviews conducted with builders/developers will be used to inform the update to CMHC's *Practices for Sustainable Communities* publication and future research and information transfer activities related to sustainable communities.

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Housing Research at CMHC

Under Part IX of the ***National Housing Act***, the Government of Canada provides funds to CMHC to conduct research into the social, economic and technical aspects of housing and related fields, and to undertake the publishing and distribution of the results of this research.

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